L 16173-65 EWT(m)/EPF(c)/EPF(n)-2/EPR Pr-4/Ps-4/Pu-4 DM

ACCESSION NR: AP4043990 S/0089/64/017/002/0144/0145

AUTHOR: Petrov, Yu. P.

TITLE: Optimal procedure for the shutdown of a nuclear reactor 19

B

SOURCE: Atomnaya energiya, v. 17, no. 2, 1964, 144-145

TOPIC TAGS: nuclear reactor shutdown, reactor reactivity losses, reactor power loss, optimal reactor shutdown

ABSTRACT: A rapid shutdown of a nuclear reactor leads to a loss of reactivity. The purpose of the present paper is to find the optimal procedure for the shutdown with a minimum of energy and reactivity losses. For simplicity, it is assumed that the reactivity depends only on the Xe^{135} content. The processes in the reactor are described by the differential equations

$$\frac{dQ_{Xe}}{dt} = \frac{Q_J}{9.7} - \frac{Q_{Xe}}{13.4} - ANQ_{Xe}$$

$$\frac{dQ_J}{dt} = BN - \frac{Q_J}{9.7}$$

Card 1/2

L 16173-65
ACCESSION NR: AP4043990

where Q_{Xe} and Q_J are the concentrations of xenon and iodine, resp., N is the reactor power, A, B - numerical coefficients, t - time, 13.4 and 9.7 are the half-periods of xenon and iodine in hours. The change of the Xe-content is found by setting N=0. The solution of the equations shows that the Xe-content increases after the shutdown, reaches a maximum after about 10 hours, and then starts to decline. The reactivity may drop to such an extent that it may be impossible to start again. The lowering of power must be gradual. By means of variational methods, the function N(t) is determined which is optimal. It turns out that N must be zero in the beginning of the shutdown; xenon content is increasing, but that of iodine drops rapidly. Then the power must be raised rapidly, and then decreased gradually to zero. Orig. art. has: no figures.

ASSOCIATION: None

SUBMITTED: 21Aug63 ENCL: 00

SUB CODE: NP NO REF SOV: 001 OTHER: 000

Card 2/2

L 36001-66 EWT(d) IJP(c)

ACC NR: AR6004028 SOURCE CODE: UR/0044/65/000/009/B063/B064

AUTHOR: Petrov, Yu. P.

TITLE: Method for finding the extremum of functionals of singular form

SOURCE: Ref. zh. Matematika, Abs. 9B325

REF SOURCE: Tr. Leningr. in-ta vodn. transp., vyp. 64, 1964, 46-49

TOPIC TAGS: functional equation, automatic control theory

ABSTRACT: The problem on the unilateral extremum of the functional

$$I = \varphi(y_m)\int_a^b F(x, y, y')\,dx,$$

is solved, where φ is some function of the maximal value of the ordinate of the plot of the desired function $y(x)$ in the interval [a,b]. The author indicates that problems of such nature frequently occur in the theory of automatic control. L. Tslaf [Translation of abstract]

SUB CODE: 12, 13

UDC: 519.31/.33

Card 1/1

L 37927-66

ACC NR: AP6024906 SOURCE CODE: UR/0317/66/000/007/0082/0082

AUTHOR: Kulibanov, Yu. M.; Neuymin, Ya. G.; Petrov, Yu. P.; Popov, S. A.; Ryabukhin, O. V.

ORG: none

TITLE: Speed regulator for marine diesel

SOURCE: Tekhnika i vooruzheniye, no. 7, 1966, 82

TOPIC TAGS: marine equipment, speed regulator

ABSTRACT: This Author Certificate introduces a speed regulator which uses a tachometer generator instead of a sounding device as a primary transducer, making the regulator

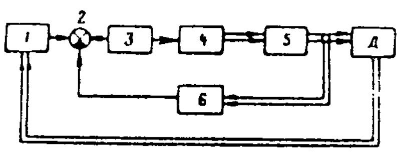

Fig. 1. Block diagram of speed regulator

1 - Tachometer generator; 2 - camparison unit; 3 - amplifier; 4 - electric motor; 5 - sliding fuel-pump-rack support; 6 - feed-back selsyn.

Card 1/2

L 37927-66

ACC NR: AP6024906

more reliable and sensitive (see Fig. 1). In the regulator, increased propeller-shaft torque activates an electric motor which in turn moves the sliding support of the fuel-pump rack, in this way decreasing the diesel's rpm. The optimum rpm decrease is predetermined. Orig. art. has: 1 figure. [GE]

SUB CODE: 13/ SUBM DATE: none/ ATD PRESS: 5048

Card 2/2

L 40785-66 EWT(1)/EWT(m)/EWP(v) RM/EM/JD

ACC NR: AP6018602 SOURCE CODE: UR/0420/66/000/004/0039/0041

AUTHOR: Petrov, Yu. P.

ORG: Kharkov Aviation Institute (Khar'kovskiy aviatsionnyy institut)

TITLE: Using the discrete method for calculating the stability of circular plates with and without central holes with homogeneous and nonhomogeneous boundary conditions

SOURCE: Samoletostroyeniye i tekhnika vozdushnogo flota, no. 4, 1966, 39-41

TOPIC TAGS: flat plate model, structure stability, computer application

ABSTRACT: The author uses a previously published method (Yu. P. Petrov, "The discrete method for calculating bending in rectangular elastic plates", *Trudy Khar'kov. aviats. in-ta*, no. 18, 1961) for calculating the stability of circular and annular plates with homogeneous and nonhomogeneous boundary conditions. It is shown that the use of the discrete method for solving this stability problem with homogeneous boundary conditions gives results which coincide with analytical solutions. Consequently the method is applicable also for calculations with various types of nonhomogeneous boundary conditions if the circular and annular plates are divided by a sufficiently large number of straight lines. A system of differential matrix equations is derived which is solved to give a system of independent functions. Thus calculations by the discrete method employ the same type of operations in a cyclic scheme which is adaptable to programming on digital computers. Orig. art. has: 4 figures, 49 formulas.

13, 09, 20/

SUB CODE: ~~[illegible]~~ SUBM DATE: none/ ORIG REF: 006

Card 1/1

L 43722-66 EWT(d)/EWT(m)/EWP(k)/EWP(w)/EWP(v) IJP(c) EM/WW
ACC NR: AP6030429 SOURCE CODE: UR/0420/66/000/006/0039/0049

AUTHOR: Petrov, Yu. P. (Docent)

ORG: none

19
B

TITLE: On designing circular cylindrical shells for strength by a discrete method

26

SOURCE: Samoletostroyeniye i tekhnika vozdushnogo flota, no. 6, 1966, 39-49

TOPIC TAGS: cylindric shell, stress analysis, shell design, cylindric shell strength, CYLINDRIC SHELL STRUCTURE, STRUCTURE STABILITY

ABSTRACT: A discrete method of designing for strength circular cylindrical shells having either uniform or nonuniform boundary conditions at the face edges (i.e., when the type of support along one portion of the edge circumference is different from the support along the rest of the circumference) is presented. The shell is divided into N longitudinal strips of equal width Rh, where R is the radius of the shell and h = 2π/n - the central angle. By applying the differential operator $\nabla^2\nabla^2 \phi = W$ (ϕ is the displacement and stress function, w - the normal displacement) to the lines between adjacent strips, and using the finite-difference relationships, a basic system of n independent differential equations of the discrete method is derived in matrix form from which all displacement components along each of the n lines can be determined. By substituting these discrete values in the V. Z. Vlasov partial differential equations for internal forces (from his General Theory of Shells), the latter can be determined in discrete form. The procedures used in determining the boundary

Card 1/2

PETROV, Yu.P.

Optimum conditions for reactor shutdown. Atom. energ. 17 no.2: 144-145 Ag '64
(MIRA 17:8)

ACCESSION NR: AR4042230

S/0124/64/000/006/V013/V013

SOURCE: Ref. zh. Mekhanika, Abs. 6V97

AUTHOR: Petrov, Yu. P.

TITLE: Calculation for bend of angle-clamped cantilever plate of variable thickness

CITED SOURCE: Tr. Khar'kovsk. aviats. in-ta, vy*p. 22, 1963, 62-78

TOPIC TAGS: cantilever plate, angle clamped cantilever plate, bend, bend calculation

TRANSLATION: Presents method of calculation for bend of angle-clamped cantilever plate of variable thickness by discrete method. As an example there is considered angle-jammed cantilever plate of constant thickness, loaded with an evenly distributed load. Solution of the problem is carried out with the help of the Ural-1 electronic digital computer. Bibliography: 11 references. f

Card 1/2

ACCESSION NR: AR4042230

SUB CODE: MA, AS ENCL: 00

Card 2/2

ACCESSION NR: AR4042229

S/0124/64/000/006/V013/V013

SOURCE: Ref. zh. Mekhanika, Abs. 6V96

AUTHOR: Petrov, Yu. P.

TITLE: Calculation for bend by discret method of orthotropid elastic plates

CITED SOURCE: Tr. Khar'kovsk. aviats. in-ta, vy*p. 22, 1963, 79-86

TOPIC TAGS: elastic plate, orthotropic elastic plate, bent surface, differential equation, boundary condition

TRANSLATION: Differential equation of a bent surface of a plate will be converted into a system of fourth-order differential equations relative to discrete functions. The form of this system depends on boundary conditions. In the particular case, the system corresponds to problems of stability. General solution of the system is sought in the form of the sum of three solutions: one of a uniform system and two solutions corresponding to external load and "contour" functions. For determination of the integration constant a system of independent discrete boundary conditions is obtained.

Card 1/2

ACCESSION NR: AR4042229

SUB CODE: AS, MA

ENCL: 00

Card 2/2

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001240520010-6"

[illegible]TKOV Yu.P.

[illegible] diesel lo[illegible]ctive. [illegible] si[illegible] [illegible] tr[illegible] [illegible]28. 163.

[illegible]

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001240520010-6"

PETROV, Yu.P., kand.tekhn.nauk

Possibilities of an asynchronous motor with frequency control. -- Sudostroenie 28 no.11:38-40 N '62. (MIRA 15:12)
(Electric motors, Induction) (Frequency regulation)

S/124/63/000/003/039/065
D234/D308

AUTHOR: Petrov, Yu. P.

TITLE: Design of plates with linearly varying thickness for bending, using a discrete method

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 3, 1963, 16, abstract 3V102 (Tr. Khar'kovsk. aviats. in-ta, 1961, no. 18, 103-115)

TEXT: The author considers the bending of a rectangular plate of linearly varying thickness, using a method stated in his previous papers (Tr. Khar'kovsk. aviats. in-ta, 1961, no. 18, 67-84, 85-101 - RZhMekh, 1962, 8V110, 8V111). [Abstracter's note: Complete translation.]

Card 1/1

PETROV, Yu.P.

Concerning two types of problems of optimum control. Sbor.rab. po vop.elektromekh. no.7:59-68 '62. (MIRA 16:1)
(Automatic control)

PETROV, Yu.P., inzh. (Leningrad)

Advantages of the independent excitation of traction engines.
Zhel. dor. transp. 45 no.5:50-51 My '63. (MIRA 16:10)

PETROV, Yu.P., kand.tekhn.nauk

Calculating the reversing of an electric motor by changing the direction of the magnetic flux. Sudostroenie 27 no.12:34-37 D '61.
(MIRA 15:1)
(Marine engineering)

TKACHEV, A.F.; PETROV, Yu.P., master

Mastering the operation of a new multistage bleaching plant. Bum. prom. 37 no.3:21-23 Mr '62. (MIRA 15:3)

1. Zamestitel' nachal'nika otbel'nogo tsekha Sovetskogo tsellyulozno-bumazhnogo kombinata (for Tkachev). 2. Sovetskiy tsellyulozno-bumazhnyy kombinat (for Petrov).
(Woodpulp)

66205

16.6800

SOV/146-58-6-6/16

AUTHORS: Nazarov, A.A., Aspirant, and Petrov, Yu.P., Senior Engineer

TITLE: Electrochemical Memory Cell

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye, 1958, Nr 6, pp 50-53 (USSR)

ABSTRACT: Development of computing technics requires designing of different devices which could record information received from arithmetical nodes of a calculating machine, keep this information, and give it out when needed. There are different requirements set before these devices. Some of them are supposed to operate at high-speeds when recording and reading; others do not require a high operational speed, but their size, simpleness of design and low cost come to the forefront. This article deals with a memory device constructed on the principle of chemical processes. The cell described in this article is based on the speed of metal precipitation on the electrodes; the last depends, in its turn, on the change of electrode potential.

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66205

Electrochemical Memory Cell SOV/146-58-6-6/16

As is well known, a metal being immersed into electrolyte has, at a certain electrolyte concentration, a sharply defined electrode potential value which can be expressed by formulae $E = E_o + k\ln a$, where E is metal electrode potential; E_o - standard electrode potential; a - cation activity in electrolyte; k - constant (at T = const.). With the flowing of DC through electrolyte, the metal is taken from one electrode precipitated on the other, thus changing the working electrode potential. The device consists of a cell provided with three electrodes: one of them is made of zinc and the other two - the working and the standard - of amalgamated copper. Zinc is precipitated on the working electrode while the standard electrode potential remains unchanged. The working and the zinc electrode are placed in one receptacle, the standard - in another (Figure 1); both receptacles are electrolytically connected. The zinc electrode is connected to +, the working, to - of the source of electric energy. The precipitation process runs according to formula $Zn^{''} + 2e \rightarrow Zn$. Zinc amalgam is formed, and

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4

electromotive force between the working and the standard electrode appears; its value is 1.1 v. The process of registration is determined by the time during which the precipitation takes place; should it be desired to obliterate the information, reverse polarity current is applied which entails returning of precipitated metal into solution in the form of ions. The electrochemical cells can be used in relay-computing machines and in other devices which do not require high operating speeds. There are 1 graph and 1 diagram.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet imeni A.A. Zhdanova (Leningrad State University imeni A.A. Zhdanov)

SUBMITTED: September 18, 1958

4

PETROV, Yu.P., kand.tekhn.nauk

Universal diagrams for the design of electric drives with semiconductor triodes. Sudostroenie 28 no.4:32-35 Ap '62.
(MIRA 15:4)

(Electricity on ships) (Triodes)

S/044/62/000/011/044/064

AUTHOR: Petrov, Yu.P.

TITLE: Fundamentals of flexure analysis of plates by the discrete method

PERIODICAL: Referativnyy zhurnal, Matematika, no. 11, 1962, 34, abstract

(Tr. Khar'kovsk. aviats. in-ta, 1961, no. 19,)

TEXT: The method of straight lines is used to solve the flexure equation of a rectangular plate of constant thickness under the action of a normal load under various conditions at the contour; $D\Delta\Delta W = q(x, y)$, where W is the deflection, D is the stiffness of the plate. For the approximate integration of the obtained system of ordinary differential equations the author sets

$$w_i(y) = \sum b_k^{(i)} \varphi_k(y) .$$

where $w_i(y)$ is the value of the deflection w on the i-th line, the functions $\varphi_k(y)$ are polynomials, the $b_k^{(i)}$ are constants. By substituting (1) in the

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Fundamentals of flexure analysis of plates by .... S/044/62/... A OX

differential equations, we obtain

$$W_i^{IV} = \varphi_i(y),$$

whence, by integration while taking the boundary conditions into account, we obtain expressions for W_i, also dependent on the constants $b_k^{(i)}$. The $b_k^{(i)}$ are determined by comparing the expressions for the W_i obtained with the expressions (1) ... Certain numerical examples are analyzed.

E.G. Globa...

[Abstracter's note: Complete translation]

Card 2/2

PETROV, Yu.P., kand. tekhn. nauk

Method of finding extremes of a particular type of functionals. Trudy LIVT no.64:46-49 '64. MIRA 18:1

S/124/62/000/008/023/030
I054/I254

AUTHOR: Petrov, Yu. P.

TITLE: Calculation of deflection of elastic rectangular plates by a discrete method

PERIODICAL: Referativnyy zhurnal, Mekhanika, Svodnyy tom. no. 8V, 1962, 16, abstract 8V 111 (Tr. Kharkovsk. aviats. in-ta, no. 18, 1961, 85-101)

TEXT: It is proposed, for sake of simplicity and higher accuracy, to substitute the differential equation of the fourth order, used for the solution of deflection of curved plate surfaces, by two differential equations of the second order. From one of them, the circumferential members are obtained and the system is written in a form of a matrix, and, according to the author, this simplifies the solution. The boundary conditions are carefully analysed for various cases of rectangular plates; numerical results are given and comparisons are made.

[Abstracter's note: Complete translation.]

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S/044/62/000/011/044/064
A060/A000

AUTHOR: Petrov, Yu. P.

TITLE: Flexure analysis of plates with linear thickness measurement by the discrete method

PERIODICAL: Referativnyy zhurnal, Matematika, no. 11, 1962, 34, abstract 11V154 (Tr. Khar'kovsk. aviats. in-ta, 1961, no. 16, 103 - 115)

TEXT: The author considers the approximate solution of the problem of flexure of a rectangular plate of variable thickness (varying linearly) under various conditions on the contour. The flexure equation

$$\Delta (D \Delta w) - (1 - \nu) \frac{\partial^2 D}{\partial y^2} \frac{\partial^2 w}{\partial y^2} = q$$

(for notations see abstracts 11V151 and 11V152) is replaced by the system of equations

$$\Delta M = q + \mu \frac{\partial^2 w}{\partial x^2} ; \quad \Delta w = \frac{1}{D} M, \quad \mu = (1 - \nu) \frac{\partial^2 D}{\partial y^2} .$$

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S/044/62/000/011/044/064
A060/A000

Flexure analysis of plates with linear ....

The method of straight lines is thereupon applied. The obtained system of ordinary differential equations is solved by an approximate method. A numerical example is analyzed.

M.G. Slobodyanskiy

[Abstracter's note: Complete translation]

Card 2/2

Petrov, Yu P

BOROVSKII, P. V. PHASE I BOOK EXPLOITATION SOV/6206 25

Konferentsiya po teorii plastin i obolochek. Kazan', 1960.

Trudy Konferentsii po teorii plastin i obolochek, 24-29 oktyabrya 1960. (Transactions of the Conference on the Theory of Plates and Shells Held in Kazan', 24 to 29 October 1960). Kazan', [Izd-vo Kazanskogo gosudarstvennogo universiteta] 1961. 426 p. 1000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Kazanskiy filial. Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina.

Editorial Board: Kh. M. Mushtari, Editor; F. S. Isanbayeva, Secretary; N. A. Alumyae, V. V. Bolotin, A. S. Vol'mir, N. S. Ganiyev, A. L. Gol'denveyzer, N. A. Kil'chevskiy, M. S. Kornishin, A. I. Lur'ye, G. N. Savin, A. V. Sachenkov, I. V. Svirskiy, R. G. Surkin, and A. P. Filippov. Ed.: V. I. Aleksagin; Tech. Ed.: Yu. P. Semenov.

PURPOSE: The collection of articles is intended for scientists and engineers who are interested in the analysis of strength and stability of shells.

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COVERAGE: The book is a collection of articles delivered at the Conference on Plates and Shells held in Kazan' from 24 to 29 October 1960. The articles deal with the mathematical theory of plates and shells and its application to the solution, in both linear and nonlinear formulations, of problems of bending, static and dynamic stability, and vibration of regular and sandwich plates and shells of various shapes under various loadings in the elastic and plastic regions. Analysis is made of the behavior of plates and shells in fluids, and the effect of creep of the material is considered. A number of papers discuss problems associated with the development of effective mathematical methods for solving problems in the theory of shells. Some of the reports propose algorithms for the solution of problems with the aid of electronic computers. A total of one hundred reports and notes were presented and discussed during the conference. The reports are arranged alphabetically (Russian) by the author's name.

PETROV, Yuriy Petrovich; NEUYMIN, Ya.G., nauchn. red.; [illegible], L.M., red.

[Variational methods in the theory of optimal control] Variatsionnye metody teorii optimal'nogo upravleniia. Moskva, Energiia, 1965. 219 p. (MIRA 18:5)

(N) L 8346-66

ACC NR: AP5025760 SOURCE CODE: UR/0286/65/000/018/0126/0126

AUTHORS: Kulibanov, Yu. M.; Neuymin, Ya. G.; Petrov, Yu. P.; Popov, S. A.; Ryabukhin, O. V.

ORG: none

TITLE: Speed regulator for marine diesel engine. Class 60, No. 174949

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 18, 126

TOPIC TAGS: diesel engine, speed regulator, marine diesel engine, MARINE ENGINEERING

ABSTRACT: This Author Certificate presents a marine diesel engine speed regulator (for keeping optimum fuel flow during operation in shallow waters) containing a transducer which interacts with the actuating mechanism. To increase reliability and accuracy, the drive shaft tachometer-generator serves as the transducer. A second feature is provided by using an electric drive as the actuating mechanism. This drive is connected through an amplifier to the tachometer-generator and synchro circuit (see Fig. 1). The synchro provides feedback from the moving actuator rod.

Card 1/2 UDC: 621.436—545.74

L 8346-66

ACC NR: AP5025760

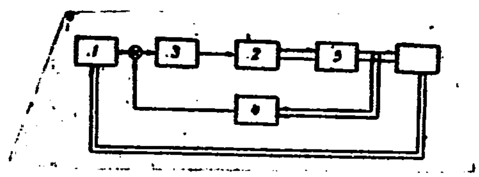

Fig. 1. 1 - Tachometer-generator;
2 - electric motor;
3 - amplifier;
4 - synchro;
5 - movable rod of the fuel pump.

Orig. art. has: 1 figure.

SUB CODE: 13/ SUBM DATE: 14Mar64

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Card 2/2

NAZAROV, A.A.; PETROV, Yu.P.

Electrochemical device accomplishing a provisory reflex. Sbor. rab. po vop. elektromekh. no.5:63-69 '61. (MIRA 14:6)
(Cybernetics)
(Automatic control)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001240520010-6"

PETROV, Yuriy Petrovich; SEMENOV, V.V., red.; ZHITNIKOVA, O.S., tekhn. red.

[Optimum regulation of electric drives] Optimal'noe upravlenie elektroprivodom. Moskva, Gos. energ. izd-vo, 1961. 186 p. (MIRA 14:11)

(Electric driving)

PETROV, Yu.P. (Leningrad)

Controlling d.c. motors by varying the magnetic flux and intensity. Izv. AN SSSR. Otd. tekh. nauk. Energ. i avtomat. no.1:119-125 Ja-F '60. (MIRA 13:2)

(Electric motors, Direct current)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001240520010-6"

9(8) SOV/146-..-5-2/19

AUTHORS: Posnov, N.N., Candidate of Physical and Mathematical Sciences, Petrov, Yu.P., Engineer, Chuguyev, G.P., Engineer

TITLE: The Operation of Relays Actuated by a Diode Pulser

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Priborostroyeniye, 1959, Nr 5, pp 13-19 (USSR)

ABSTRACT: The authors investigated two-coil "RMU" relays (relay adjustment sheet RS4 523.360, nominal voltage 27 volts, coil resistance 220 and 280 ohms), receiving pulses from an alternating current grid through a circuit forming a series of semi-sinusoidal pulses called diode pulses (Figure 2). The results obtained are also valid for other fast operating relays. Blocking by separate windings, as well as blocking by one winding (Figure 7) are discussed, and the respective oscillograms of the current and voltage are illustrated (Figures 5,6). One disadvantage of the diode pulser is that only pulses

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SOV/14...-5-.../...

The Operation of Relays Actuated by a Diode Pulser

of a fixed duration (10 milliseconds); can be generated; therefore, such circuits must have an additional pulse-multiplying circuit The first ever method of multiplying cadence pulses was developed and applied at the Leningrad Electrical Engineering Communication Institute imeni Boch-Bruyevich, where the relay computer "Sintez" was built and is now used in accordance with this method It is concluded that diode pulsers have great advantages over square-pulse pulsers because the overvoltages are many times lower and the operational conditions of the relays and diodes are improved. For full utilization of relays in complex circuits, the peculiarities of relays fed through a diode pulser must be duly considered. The a c voltage must be selected in accordance with the rules mentioned in the article The voltage in blocking circuits of relays working with hot windings must be lower than in control circuits. For quick cut-out of blockings the

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SOV/146-2-5-2/19

The Operation of Relays Actuated by a Diode Pulser

relay must be lifted by two contacts. The article was recommended by the Kafedra teoreticheskoy radiotekhniki Leningradskogo elektrotekhnicheskogo instituta svyazi imeni M.A. Bonch-Bruyevicha (Chair of Theoretical Radio Engineering of the Leningrad Electrical Engineering Communication Institute imeni M.A. Bonch-Bruyevich). There are 8 diagrams.

ASSOCIATION: Leningradskiy vychislitel'nyy tsentr (Leningrad Computing Center)

SUBMITTED: January 4, 1959

Card 3/3

Petrov, Yu.P., inzh.

Valve-type electric drive equipped with preconnected capacitors. Sudostroenie 24 no.5:33-36 My '58. (MIRA 11:6)
(Electric driving)

PETROV, Yu.P.; POSNOV, N.N.

Table calculating machine equipped with electromagnetic elements.
Priborostroenie no.3:8-10 Mr '61. (MIRA 14:3)
(Electronic digital computers)

PETROV, Yu.P., inzh. (Leningrad).

Transient processes in an electric drive when magnetic flux varies exponentially. Elektrichestvo no.4:35-38 Ap '58. (MIRA 11:5)
(Transients (Electricity))

PETROV, ...

AUTHOR: Petrov, ..., Engineer, (Leningrad) 105-58-4-7/...

TITLE: Transition Process in Motor-Drive With Exponentially Varying Magnetic Flux (Perekhodnyye protsessy elektroprivoda pri eksponentsial'nom izmenenii magnitnogo potoka)

PERIODICAL: Elektrichestvo, 1958, Nr 4, pp. 35-38 (USSR)

ABSTRACT: In a number of d.c. drives the transient processes take place with an exponential variation of the magnetic flux. This processes also comprise starting of the motor without previous connection of the exciter winding, the velocity control of the motor by varying the magnetic flux etc. The author investigates the functions of a parameter (and of time). This functions offer the possibility to carry out very easily the calculation of the transient processes. The following is assumed: a) the magnetic flux increases and decreases according to an exponential curve, b) no armature reaction is present, c) the armature inductivity is equal to zero, d) the moment of resistance of the drive is constant. Taking into account these assumptions the differential equations (1) of the drive are put down for the case of a starting of the motor without previous connection of the

Card 1/3

Transition Process in Motor-Drive With Exponentially Varying Magnetic Flux 105-58-4-7/37

exciter winding. Relative magnitudes are introduced for the amperage, speed, time and moment. The equation (4) is obtained which can be represented in form of a three-component sum. The functions f_1, f_2 and f_3 occurring depend on two parameters, x (relative time) and k (time constant of the exciter winding caused by the electromechanical time constant) Therefore they can be represented as sets of curves. In motor drives of small power k = 0,2-1, in those of medium power k = 0,5-5. The curves obtained this way can be used for arbitrary values of the magnetic flux in the beginning. The method given here is explained by 4 examples. The comparison of the calculation results with the data of experiments shows that the neglection of armature inductivity causes a noticeable error only with respect to the beginning of the process. The curves on the dependence of the maximum electric torque on k and that of the ratio between the armature circuit time constant and the electromechanical time constant are given. By their means the calculation of the electric torque can be corrected. There are 3 figures and 2 Soviet references.

Card 2/3

3-58-7-8/26

AUTHOR: Petrov, Yu.I., Learned Secretary of the Philosophical Section

TITLE: An Inter-Vuz Scientific Conference on the Criticism of Contemporary Philosophical Revisionism (Mezhvuzovskaya nauchnaya konferentsiya po kritike sovremennogo filosofskogo revizionizma)

PERIODICAL: Vestnik vysshey shkoly, 1958, Nr 7, p 71 (USSR)

ABSTRACT: This conference took place in Moscow on 27-31 May 1958. It was called by the Ministry of Higher Education. A total of 500 philosophy teachers took part. Numerous lectures on problems of historical materialism, of philosophical revisionism and other philosophical subjects were delivered by: Member-Correspondents of the AS USSR, Professors F.V. Konstantinov and M.T. Iovchuk; Professors D.I. Chesnokov, T.I. Oyzerman, V.S. Molodtsov, G.S. Vasetskiy, I.N. Sarochka; Candidates of Philosophical Sciences A.F. Petrasnik, D.I. Sorov, V.I. Shishkina, A.I. Burkhard and A.I. Sutenko; Dotsents M.I. Petrosyan and V.F. Ovsyannikov.

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3-1-1/32

AUTHOR: Kaltakhchyan, S.T., and Petrov, Yu.P., Candidates of Philosophical Sciences

TITLE: The Vuzes' Research Work in Philosophy is to be Developed in Every Way (Vsemerno razvivat' v vuzakh issledovaniya po filosofii)

PERIODICAL: Vestnik Vysshey Shkoly, 1958, # 1, pp 3-12 (USSR)

ABSTRACT: The article mentions the great work performed by the instructors of the chairs of philosophy in popularizing the Marx-Lenin philosophy, and the improvements noted in the scientific work of the educational institutions after the 20th Communist Party Congress. It describes the problems that Soviet philosophy has to face, enumerates a number of shortcomings in the scientific work, indicating how they can be overcome, and lays stress on the leadership of the principal chairs which include a number of other chairs of philosophy.

The article points out that Soviet philosophers are aware of the fact that propagandist activity alone is insufficient under the present conditions, and that their scientific work lags behind the demand of impetously developing life and the

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theory of class struggle, the proletarian revolution, etc. At present, the bourgeois ideologists, the critics of Marxism, increase their offensive also against dialectical materialism. The author then deals more closely with dialectical materialism, stating that its fundamental problems are still being insufficiently developed by many chairs of philosophy. The new program of the course in dialectical and historical materialism contains special themes criticizing the present bourgeois philosophy and sociology. Quite a few instructors know foreign languages but not many come forth with reviews on bourgeois philosophical literature published abroad.

Dealing with the question of cooperation of all philosophical chairs, the author states that the Section of Philosophy of the Administration for Teaching Social Sciences (Otdel filosofii Upravleniya prepodavaniya obshchestvennykh nauk) and the Philosophical Section of the Scientific-Technical Council of the USSR Ministry of Higher Education (Filosofskaya sektsiya Nauchno-tekhnicheskogo soveta Ministerstva vysshego obrazovaniya SSSR) have so far failed to guide systematically the chairs' scientific work. The author mentions a number of other

S/194/62/000/001/031/066
D201/D305

16.8000

AUTHORS: Nazarov, A. A. and Petrov, Yu. P.

TITLE: An electrochemical conditioned reflex arrangement

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 1, 1962, abstract 1-2-92 b (Sb. rabot po vopr. elektromekhan. In-t elektromekhan. AN SSSR, 1961, no. 5, 63-69)

TEXT: The results of investigations into the possibility of designing a conditioned reflex cell on the basis of an electrochemical storage element developed by the authors. General considerations as to the possibilities of obtaining cells of the given type are given. The circuit of a conditioned reflex cell is analyzed. The cell has an electrochemical counter which leads to the process of generation and extinction of the conditioned reflex process similarly to such processes in live organisms. The possibility of reproducing by a simple circuit some of the characteristics of a live organism behavior is given. 1 figure. /Abstracter's note: Complete translation./

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VB

PETROV, Yuriy Pavlovich; ZENIN, V., redaktor; DANILINA, A., tekhnicheskiy redaktor

[Military commissars during the Civil War (1918-1920) Voennye komissary v gody grazhdanskoi voiny (1918-1920gg). Moskva, Gos. izd-vo polit. lit-ry, 1956. 146 p. (MIRA 9:7)
(Russia--Revolution, 1917-1921)
(Russia--Army--History)

P TROV, YU. P.

Russia - Revolution, 1917-1921

Political commissars in the army during the years of foreign military intervention and of the civil war (1918-1920), Vop. ekon. ist, No. 2, 1952.

Monthly List of Russian Accessions, Library of Congress, May 1952, Unclassified.

S/147/59/000/04/020/020
E031/E413

AUTHOR: Zolotukhin, V.K.,

TITLE: The Scientific-Technical Conference at Khar'kov Aviation Institute

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, 1959, Nr 4, pp 161-165 (USSR)

ABSTRACT: In May 1959, the 16th Conference of Professorial and Teaching Staff took place.

Strength of Aircraft Section.
"On the Theory of Bending of Thin-Walled Columns" by Docent, Candidate of Technical Sciences L.P.Vinokurov; "The Simulation of Static Experiments on Thin-Walled

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Structures" by Candidate of Technical Sciences L.A.Kolesnikov and Senior Instructor V.K.Zolotukhin; "The Bending of Beams Framing an Opening" by Candidate of Technical Sciences L.A.Kolesnikov; "The Influence of the Rigidity of Ribs and Beams on their Bending" by Assistant N.A.Shelomov; "The Calculation of the Bending of Rectangular Plates" by the Discrete Method" by Assistant Yu.P.Petrov; "The Calculation of Cylindrical Shells" by the Method of Discrete Variables" by Aspirant N.I.Gur'yev.
Engine Construction Technology Section.
"The Choice of a Scheme for a Hydraulic Servo-System for the Automation of Welding Processes" by Assistant V.V.Balatskiy; "An Investigation of the Process of Polishing by an Abrasive Belt" by Senior Instructor, Candidate of Technical Sciences V.N.Verezub; "The Investigation of the Operation of a Pneumatic-Hydraulic Plant" by Assistant V.I.Basteyev;

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"A Static Analysis and Calculation of the Accuracy of the Technological Processes of Machining" by O.M.Parkhomenko; "The Automatic Welding of Long Panels" by Candidate of Technical Sciences L.F.Kamakov; "Prospects in the Use of Specialised Computers for the Determination of the Optimum Geometry of Cutting Tools" by Docent, Candidate of Technical Sciences V.P.Kosharnovskiy; "The Spreading of the Experience of Innovators and the Classification of Organisational-Technical Measures in Machine Construction" by Senior Instructor M.M.Apanovich; "Features of Measurable Abrasion of a Cutting Tool in Fine Sharpening" by Assistant V.N.Malikov; "An Investigation of the Process of Compression at High Velocities of Deformation" by Docent, Candidate of Technical Sciences A.K.Bayev; "The Standardization of Vibration Effects on the Human Organism in Aircraft Production" by Senior Instructor V.D.Ivanov,
Theory and Construction of Aircraft Engines and Propellor-Driven Machines Section. "The Investigation

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of the Flow Between the Inlet and Outlet Valves of a Turbine" by Instructor, Candidate of Technical Sciences V.N.Yershov; "The Variation in the Stage Parameters of an Axial Compressor in Accordance with the Size of the Radial Clearance" by Assistant A.N.Anyutin; "On the Problem of Non-Stationary Heat Transfer" by Assistant S.D.Frolov; "The Influence of an Electric Field on the Flame of a Burner" by Senior Engineer P.P.Kostenko, "Calculation of the Temperature Compensation of Capacitance Pressure Pick-Ups" by Assistant L.Ya.Astaf'yev.
Aerohydrodynamics Section.
"Ideal Hypersonic Flow Round a Body" by Assistant V.I.Sholyavko; "The Control of the Boundary Layer of a Wing by Perforation of the Leading Edge" by Assistant Ye.P.Vechasov; "The Gas-Hydraulic Analogy and its Application" by Senior Instructor D.A. [illegible]; "The Aerodynamic Investigation of [illegible] at Small Reynolds Numbers" by Engineer [illegible]

SOV/144-59-5-10/14

AUTHOR: Petrov, Yu.P., Senior Engineer

TITLE: The Acceleration and Deceleration of d.c. Traction Motors According to Optimum Laws

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1959, Nr 5, pp 92 - 97 (USSR)

ABSTRACT: It is of interest to know how to regulate the armature current of traction motors during acceleration and deceleration so as to ensure the best utilisation of transport within given limitations of motor heating, speed, etc. The considerations are based on Eq (1), which is the fundamental equation of the dynamics of rolling stock, and when this equation is expressed in relative units Eq (2) is obtained. It is taken that the best control law should give the greatest integral of speed for a given time, which may also be expressed as the minimum time for a given distance travelled. Because acceleration and deceleration times are much shorter than the heating time-constants of the traction motors, the limitation of heating becomes a limitation on the quantity of heat which may be evolved in the windings in a given time. This is expressed in relative units in Eq (4). The problem of

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SOV/144-59-5-10/14

The Acceleration and Deceleration of d.c. Traction Motors according to Optimum Laws

determining the best control law consists in [illegible] current and speed as a function of time which give the greatest distance covered (see Eq (3)) for a given amount of heat evolved (see Eq (4)). The problem is solved by the calculus of variations. A separately-excited motor is considered first for the sake of convenience although, of course, series traction motors are the most commonly used. The amount of heat generated in a given time in a separately-excited traction motor is expressed by Eq [illegible]. The speed and current are given by Eq (9), from which it follows that the optimum current diagram is a straight line diagram with negative angular coefficient, as in Figure 1. The methods of determining the constants of integration in expressions (9) are then explained. Expressions (10) to (13) may be used to determine the optimum process of control for this type of motor. The

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SOV/144-59-5-10/14

The Acceleration and **Deceleration** of d.c. Traction Motors According to Optimum Laws

current and speed conditions that give the least heating are illustrated graphically in Figure 1, but this curve is of use only when the travelling time is not limited. The case is then considered when the maximum permitted speed is lower than that given by Eq (13). In this case formula (9) is valid only until the limiting speed is reached, and it is then shown that the linear current law gives the smallest motor for a given performance. Determination of the best control conditions for a series motor is then considered. The relationship between the current and magnetic flux for such motors is given by Eq (14). Then it is shown that the time function of magnetic flux with optimum control is given by Eq (16) from which the armature current may be found by means of Eq (14); after which it is easy to find the speed as a function of time. Figure 2 shows graphs of optimum control during acceleration of a traction motor of given characteristics. It will be seen that, as is usually the case, the best

Card 3/4 current diagram during acceleration is very nearly linear.

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The Acceleration and Deceleration of d.c. Traction Motors According to Optimum Laws

Because of this it is convenient first to make the calculations as though the current laws were linear and then to introduce corrections according to Eq (16). Eq (16) is derived on the assumption of constant torque. If this assumption is not made, the flux law is given by expression (17) in which case the optimum control law is an exponential function.

There are 2 figures and 4 Soviet references.

ASSOCIATION: Leningradskoye otdeleniye matematicheskogo instituta AN SSSR (Leningrad Division of the Mathematical Institute, Ac. Sc., USSR)

SUBMITTED: December 14th, 1958.

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PETROV, Yu.P. (Leningrad)

Optimum control of an electric drive with the moment of resistance being dependent on the distance displaced. Izv.AN SSSR.Otd.tekh.nauk.Energ.i avtom. no.2:198-202 Mr-Ap '60. (MIRA 13:4)

(Electric driving) (Automatic control)

16.9500

307/...

AUTHOR: Pe..., ... P. (Len...)

TITLE: Optimum ... Control of In...tion Motors

PERIODICAL: Avtomatika i Telemekhanika, ..., Vol. 21, Nr 4, pp ... (USSR)

ABSTRACT: In this study principles are derived for frequency and voltage control so as to ensure optimum transient processes in the system. The analysis is made under the assumption that the resistance moment depends linearly on the speed of rotation. Analysis is carried on for two groups of driven systems: In the first group, the maximum displacement of the performing element must be accomplished at given initial and final rotation speeds and in a given time; in the second group, the maximum change in the rotation speed must be attained in a given time. The analysis is made in relative units. The following notations are introduced for quantities expressed in such units: M, rotation moment; μ, resistance moment; τ, time; ν, rotational speed;

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Optimum Frequency Control of Induction Motors

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ω, frequency of rotor current; I, the current; f, stator frequency. Two assumptions are imposed: (1) The actual magnetization curve is substituted for by two straight-line sections. (2) The electromagnetic transient states are neglected. The equation of dynamic state of the system is

$$M - \mu = \frac{d\nu}{d\tau}. \qquad (2)$$

Rotation moment M and thermal losses Q are expressed as follows:

$$M = \frac{2\Phi^2\omega}{1 + \omega^2}, \qquad (3)$$

$$Q = \int_0^{\tau} \frac{2\Phi^2\omega^2}{1 + \omega^2}\, d\tau, \qquad (4)$$

where Φ is magnetic flux expressed in relative units. The efficiencies of the electrical drives of the first and second groups are proportional to the following integrals, respectively:

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Optimum Frequency Control of Induction Motors

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$$\Delta_2 = \int_0^{\tau} \nu d\tau, \qquad (5)$$

$$\Delta_1 = \int_{\nu_1}^{\nu_2} d\nu = \int_0^{\tau} \dot{\nu} d\tau. \qquad (6)$$

The magnetic saturation imposes on the magnetic flux Φ the following limitation:

$$0 \leqslant \Phi \leqslant 1. \qquad (8)$$

For rotational speed the following limitations are valid:

$$\nu \leqslant \nu_{MAX}$$

and at $\mu = 0$

$$\nu_{MAX} = 1 \qquad (9)$$

Law of Optimum Control for Electrical Drives of the First Group. Quantities $\omega = \omega(\tau)$ and $\Phi^{\circ} = \Phi^{\circ}(\tau)$

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must be determined for which the maximum value of the integral (5) is obtained at given values of the integral (4) of Eqs. (2) and (3) and at limitations (8) and (9). This is the general Lagrange problem of the calculus of variations. Solving Euler equations, the results are as follows: The optimum voltage control is such a control that, when voltage drop in the stator winding is accounted for, the magnetic flux that appears will be constant. The rules of the optimum change of the frequency of rotor current are:

μ = const

$$\frac{2\omega}{1+\omega^2} = C_2 - \lambda_0\tau; \qquad (16)$$

and at $\mu = \mu_0 + k\nu$

$$\frac{2\omega}{1-\omega^2} = \frac{\lambda_0}{k} - C_1 e^{k\tau} \qquad (17)$$

Law of Optimum Control for Electrical Drives of the Second Group. Quantities $\omega(\tau)$ and $\Phi'(\tau)$ must be determined for which the maximum value of the

Optimum Frequency Control ... Motors

SOV/...

... values of the ... ( ) of Eq. ( ) ... ( ) ... the limitation ( ). The ... problem is similar to that for the ... of electrical drives. The optimum ... constant value of the ... $\mu_0 + k\gamma$ the equation for optimum ... frequency is given in the form:

$$\Gamma^{2m}_{\omega^2} \quad C_3 e^{k\gamma}. \qquad (20)$$

On Fig. ... optimum control of a motor driving a system of the first group is shown. Determination of Coefficients in the Extremal Equations. For Eq. (1) auxiliary expressions are given in order to simplify the calculations. An example illustrating their use is given. In conclusion, the author states that: (1) There exists an optimum frequency control of an induction motor assuring maximum efficiency of the electric drive at given heating limitations.

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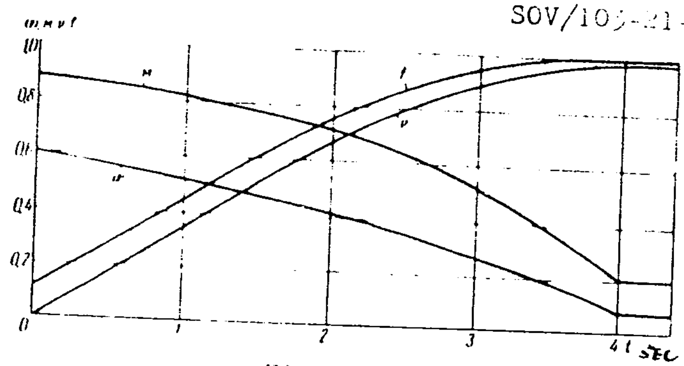

Fig. .

(..) The optimum control depends on the features of the electrical drive and on the change in the resistance moment. The main features of this paper were presented October ., . 58 at the All-Union Conference for Theory and Application of Discrete Automatic Systems (Section on Theory of Optimum Systems). There are 2 figures; and . Soviet references.

SUBMITTED: November ., 195.

S/054/60/000/004/012/015
B004/B056

AUTHOR: Petrov, Yu. P.

TITLE: A Method of Determining the Second Moment of the Line of Nuclear Magnetic Resonance

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1960, No. 4, pp. 119-122

TEXT: In order to avoid complicated numerical integration when determining the second moment of the absorption line of nuclear magnetic resonance, the author suggests to measure the amplitude of the harmonics of the signal. Assuming a symmetric absorption line, an equation is written for the second harmonic, integration being carried out first over a finite region:
$\overline{\Delta H^{2*}} = \int_{-h_m}^{h_m} h^2 A(h)dh \Big/ \int_{-h_m}^{h_m} A(h)dh$ (2). A(h) is the function describing the contour of the absorption line; h is the deviation of the magnetic field from the resonance value. For saw-tooth and sinusoidal modulations of the

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A Method of Determining the Second Moment of the Line of Nuclear Magnetic Resonance

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B004/B056

magnetic field, the functions for h are written, and integration is carried out according to equation (2). There are 3 figures and 2 non-Soviet references.

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S/054/60/000/004/013/015
B 04/B056

AUTHOR: Petrov, Yu. P.

TITLE: The Influence of the Time Constant of a Phase Detector Upon the Second Moment of the Line of Nuclear Magnetic Resonance

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1960, No. 4, pp. 123-125

TEXT: The present paper deals with the calculation of the influence exerted by the time constant of a phase detector upon the second moment of the line of nuclear magnetic resonance. It is shown that the real second moment may be calculated from experimental data. The phase detector is simulated by the circuit of Fig. 1, and the time constant is given as $\tau = rRC/(r+R)$. For the interrelation between input signal $f(t)$ and output signal $F(t)$ the following relation is obtained: $F(t) = rf(t)/(R+r) - \tau dF(t)/dt$ (5). From the experimental first and second moments, the velocity $v = dH/dt$ of the magnetic field, and the time constant τ, the real second moment ΔH^2 is calculated to be

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The Influence of the Time Constant of a Phase Detector Upon the Second Moment of the Line of Nuclear Magnetic Resonance

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$$\overline{\Delta H^2} = \overline{\Delta H^{2*}} - (\overline{\Delta H^*})^2 - v^2\tau^2 . \overline{\Delta H^{2*}} = v^2 \int_{-\infty}^{\infty} (t - t')^3 F(t)dt/3 \int_{-\infty}^{\infty} (t - t')F(t)dt.$$

There are 2 figures, 1 table, and 3 non-Soviet references.

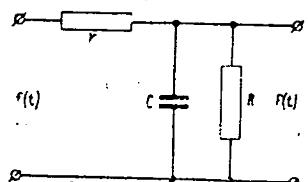

Fig. 1

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POSNOV, N.N., kand.fiz.-mat.nauk; PETROV, Yu.P., inzhener; CHUGUYEV, G.P., inzhener.

Operating a relay with a diode pulsator. Izv.vys.ucheb.zav.; prib. 2 no.5:13-19 '59. (MIRA 13:5)

1. Leningradskiy vychislitel'nyy tsentr. Rekomendovana kafedroy teoreticheskoy radiotekhniki Leningradskogo elektrotekhnicheskogo instituta svyazi imeni M.A.Bonch-Bruyevicha.
(Electric relays)

PETROV, YU.P.

Vsesoyuznoye ob"yedinennoye soveshchaniye po avtomatizatsii proizvodstvennykh protsessov v mashinostroyenii i avtomatizirovannomu elektroprivodu v promyshlennosti. 3d, Moscow, 1959

Elektroprivod i avtomatizatsiya promyshlennykh ustanovok; trudy soveshchaniya (Electric Drive and Automation in Industrial Systems; Transactions of the Conference) Moscow, Gosenergoizdat, 1960. 470 p. 11,000 copies printed.

General Eds.: I.I. Petrov, A.A. Sirotin, and M.G. Chilikin; Eds.: I.I. Sud, and R.F. Silayev; Tech. Eds.: K.P. Voronin, and G.Ye. Larionov.

PURPOSE: The collection of reports is intended for the scientific and technical personnel of scientific research institutes, plants and schools of higher education.

COVERAGE: The book is a collection of reports submitted by scientific workers at plants, scientific institutes and schools of higher education at the third Joint All-Union Conference on the Automation of Industrial Processes in Machine Building and Automated Electric Drives in Industry held in Moscow on May 12-16, 1959. The Conference was called by the Academy of Sciences USSR, the Gosplan SSSR (State Planning Commission USSR), the GNTK SSSR, the Gosudarstvennyy Komitet po avtomatizatsii i mashinostroyeniyu (State Committee on Automation and Machine Building) and the Natsional'nyy Komitet SSSR po avtomaticheskomu upravleniyu (USSR National Committee on Automatic Controls) and prepared by the Nauchno-tekhnicheskiy komitet po avtomatizirovannomu elektroprivodu (Scientific and Technical Committee on Automated Electric Drives), the MEI (Moscow Institute of Energetics), the VNIIEM, the IAT (Institute of Automation and Telemechanics) of the Academy of Sciences USSR, and the Komissiya po tekhnologii mashinostroyeniya Instituta mashinovedeniya AN SSSR (Commission on the Technology of Machine Building of the Institute of Science of Machines of the Academy of Sciences USSR). It was the purpose of the Editorial Board to arrange the reports in a way which would ensure a relatively systematic presentation of theoretical and practical problems relating to electric drives and automatic controls of industrial mechanisms used in various branches of industry. Basic problems of automated electric drive and their solution are outlined. The book also contains articles on electric machinery and means of automation. Considerable attention is paid to noncontact automatic control systems, including systems with semiconductor devices and magnetic amplifiers, and to computers intended both for the analysis and the synthesis of linear and nonlinear automatic regulation and control systems. Reports already published in journals or official publications have been considerably abbreviated; those which have appeared in volume V of SII EP transactions or in the journal "Elektrichestvo" are marked with an asterisk. No personalities are mentioned. References accompany some of the papers.

PART I. GENERAL PROBLEMS CONCERNING THE THEORY AND PRACTICE OF ELECTRIC DRIVE AND AUTOMATION OF CONTROL

PART II. ELECTRIC DRIVES OF METALLURGICAL INSTALLATIONS

PETROV, Yu. P. (Leningrad)

Optimum frequency control of electric induction motors. Avtom. i telem. 21 no.3:333-339 Mr '60. (MIRA 13:6)
(Electric motors, Induction) (Frequency regulation)

S/024/60/000/01/014/028
E194/E355

AUTHOR: Petrov, Yu.P. (Leningrad)

TITLE: The Control of DC Motors By Alteration of Magnetic Flux and Voltage

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, Nr 1, pp 119-125 (USSR)

ABSTRACT: Consider a DC motor whose behaviour is described by Eq (1), which gives the equilibrium of emf and Eq (2), which gives the equilibrium of torque on the shaft. When expressed in relative units these expressions assume the form of Eqs (3) and (4). In these equations the terminal voltage and magnetic flux are variables, which can be controlled as required, and it is desired to determine the optimum control giving the greatest mechanical output. Radical simplifying assumptions are made in this simple treatment of the subject; in particular, the flux Φ is assumed to be independent of the armature current. M is the torque and subscript 'max' denotes a maximum permitted or physically possible value. Here u is the voltage applied to the armature (the other variable Φ being the first) and ν is speed.

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The Control of DC Motors by Alteration of Magnetic Flux and Voltage

Electrical drives are classified into two groups. In the first the output is proportional to the change of speed of the driven mechanism in a given time, i.e. is proportional to the integral given by expression (5). The output of drives of the second group is proportional to the distance traversed by the mechanism, that is, to the integral given by expression (6). The first group includes accelerating machines and the second includes drives of auxiliary mechanisms of rolling mills, traction motors, lifts and so on. If the utilisation of the motor is limited by heating, Eq (8) must be fulfilled; it is assumed that k in Eq (8) is constant. The value of the constant in this equation depends on whether the hottest spot occurs in the armature or in the field winding. The mathematical problem of optimum control for drives of the second type is formulated as follows: it is necessary to find a pair of functions of current and flux as functions of time which give a maximum value for integral (6) for a given value of integral (8); they must simultaneously

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The Control of DC Motors by Alteration of Magnetic Flux and Voltage

satisfy Eqs (3) and (4). This is the general Lagrange problem in variational calculus. Variables are substituted and three possibilities may arise on solution: the functions may be extremal and satisfy two Euler equations; the functions may be boundary curves; or the solution may consist of parts of both of the first two cases. The Euler equations are then formulated and shown to be contradictory, so that this particular problem has no optimum solution for functions having a continuous differential coefficient. In this case the maximum of the integral (6) occurs with discontinuous functions. The method of determining these discontinuous functions is then explained and discloses that the condition of maximum possible evolution of heat in the windings limits only the maximum speed during the cycle. Unless allowance is made for limitation of saturation, the problem of the optimum equation has no general physical meaning. The problem acquires physical meaning only if saturation is allowed for and the permeability becomes constant. Previous authors have already solved the problem for the second class of

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drive in this case.
The problem of finding the optimum equations for the armature current and magnetic flux for drives of the first class is then considered. The mathematical formulation of the problem is to find a pair of functions which express speed and magnetic flux as functions of time. They must give the maximum value to integral (5) for a given value of integral (9), allowing for saturation and must satisfy the Euler equations. It is shown that for drives of this class integral (5) is a maximum for any pair of functions that fulfil Eq (12). To ensure optimum control it suffices to maintain a proportionality between the armature current and magnetic flux. For electrical drives of the first class, when saturated, the optimum law is that of constant armature current as distinct from the linear law valid for drives of the second class.
It is further shown that the optimum law of control of acceleration of an electric drive with constant voltage on the motor terminals consists of maintaining constant armature current. The speed then rises according to a

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The Control of DC Motors by Alteration of Magnetic Flux and Voltage

parabolic law and the magnetic flux is weakened in inverse proportion to the speed. The position is briefly illustrated by a worked example. The mathematical formulation for drives of the second type is then recapitulated.
It is concluded that if there is no limitation on voltage then for all drives of the second class and most of the first class the optimum law of control is obtained by maintaining the magnetic-flux constant. If, on maintaining the magnetic-flux constant the necessary voltage on the armature terminals becomes excessive the magnetic flux should be weakened in accordance with the Formula (21) for drives of the first class and Formula (25) for drives of the second class. There are 1 figure and 6 Soviet references.

SUBMITTED: October 19, 1959

Card 5/5

S/024/60/000/02/027/031
E073/E135

AUTHOR: Petrov, Yu.P. (Leningrad)

TITLE: Optimum Control of an Electric Drive in the Case when the Resistance Moment Depends on the Travelled Distance

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, Nr 2, pp 198-202 (USSR)

ABSTRACT: Other authors (Refs 1-3) have dealt with the problem of optimum control for the case when the resistance moment of the excitation mechanism is constant. In earlier work (Ref 4) the author of this paper dealt with the more complicated problem when the resistance moment of the excitation mechanism is dependent on the rotation speed. In this paper the more general case is considered when the resistance moment of the electric drive depends on the speed of rotation as well as on the distance travelled. Examples of such electric drives are traction motors, for instance for mine shafts and lifts, when it is necessary to take into consideration the weight of the rope wound on the drum, or for the case of flying shears and numerous other applications. In the case of

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Optimum Control of an Electric Drive in the Case when the Resistance Moment Depends on the Travelled Distance

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E073/E135

a constant transmission ratio the dependence of the resistance moment on the distance travelled can be reduced to a dependence on the angle of rotation of the shaft of the electric motor. This case is analysed in some detail, and the use of the derived solutions is illustrated on an example of an electric drive in which the resistance moment changes according to the relation

$$\mu = 1 + \sin 2\pi\alpha$$

It is emphasised that optimum control of the motor reduces considerably the losses, but such control requires laborious calculations even in relatively simple cases. Furthermore, full information is necessary on the resistance encountered throughout the entire process of movement.

There are 3 figures and 4 Soviet references.

Card 2/2

SUBMITTED: December 17, 1959

PETROV, Yu.P.

Method of determining the second moment of the nuclear magnetic resonance line [with summary in English]. Vest. LGU 15 no.22: 119-122 '60. (MIRA 13:11)

(Nuclear magnetic resonance)

PETROV, Yu.P.

Influence of the time constant of a phase detector on the second moment of a nuclear magnetic resonance line [with summary in English]. Vest. LGU 15 no.22:123-125 '60. (MIRA 13:11)
(Nuclear magnetic resonance)

PETROV, Yuriy Petrovich; NEUYMIN, Ya.G., red.; ZHITNIKOVA, O.S., tekhn. red.

[Calculation of transient processes of d.c. motors using universal diagrams in similitude criteria] Raschet perekhodnykh protsessov elektrodvigatelei postoiannogo toka s pomoshch'iu universal'nykh diagramm v kriteriiakh podobiia. Moskva, Gosenergoizdat, 1963. 61 p. (MIRA 16:10)

(Electric motors, Direct current)

PETROV, Yu. P., KOVALEV, V. K. and BARANOVSKIY, V. V.

"A device for investigating optical functions given a limited time for the presentation of objects" - p. [illegible]

Voyenno Meditsinskiy Zhurnal, No. [illegible], [illegible]

L 13230-63 EWP(r)/EWT(1)/EWT(m)/BDS AFFTC

S/044/63/000/003/041/047

AUTHOR: Petrov, Yu. P.

52

TITLE: Calculating the bending of elastic nonrectangular plates by means of a discrete method

24

PERIODICAL: Referativnyy Zhurnal, Matematika, no. 3, 1963, 6, Abstract 3V22 (Tr. Khar'kovsk. Aviats. In-ta, no 21, 1961, 3-36).

TEXT: A plate is examined in an XOY coordinate system. Its AD and BC edges are parallel while its AB and CD edges are bounded by smooth curves $S_1 = f_1(s)$ and $S_2 = f_2(s)$. The bent surface of this trapezoidal (so termed by the author) is described by the differential equation

$$D \nabla^2 \nabla^2 W(x, y) = q(x, y).$$

Integration of this equation by means of a discrete method (the method of straight lines) leads to cumbersome systems of linear fourth-order differential equations. In the author's opinion, however, solving the system is simplified

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if the discrete method is applied to the system

$$\nabla^2 M(x, y) = q(x, y)$$

$$D \nabla^2 W(x, y) = M(x, y)$$

where $\nabla^2 = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}$; $M = -\frac{1}{1+\nu}(M_x + M_y)$ is the function of the reduced bending moments; M_x and M_y are the bending moments in the sections of the plate which are parallel to the Y- and x-axes respectively; $W(x, y)$ is the function of bending of the plate; $q(x, y)$ is the external load on the plate; D is the cylindrical regidity of the plate; ν is Poisson's ratio. In this case the accuracy of the solution is improved, some advantage is gained in simplicity, and the bending moments can be computed without using formulas for numerical differentiation. The author considers three problems: the problem which is not symmetric in respect to the X-and Y-axes, that which is symmetric, and the inverse symmetric problem. A basic system of matrix differential

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equations associated with the discrete method and consisting of n independent systems of ordinary differential equations, each of which consists of two second-order equations, is described in each problem for the chosen number of straight lines n. This facilitates the integration of the basic systems of differential equations associated with the discrete method. The right hand sides of the differential equations that are obtained contain the so-called "contour" functions

$$M(x, y)\Big|_{y=0} = M_0(x); \quad W(x, y)\Big|_{y=0} = W_0(x),$$

$$M(x, y)\Big|_{y=a} = M_{n+1}(x); \quad W(x, y)\Big|_{y=a} = W_{n+1}(x).$$

They are unknown, but they will be smooth and continuous for any external load, which makes it possible to replace them by "contour" polynomials with unknown coefficients

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$$W_0 \cong \tilde{W}_0 = \sum_k c_k^{(0)} x^k, \quad M_0 = M_0 = \sum_k d_k^{(0)} x^k,$$

$$W_{n+1} \cong \tilde{W}_{n+1} = \sum_k c_k^{(n+1)} x^k, \quad M_{n+1} \cong M_{n+1} = \sum_k d_k^{(n+1)} x^k.$$

In the general case, as the author pointed out, the system of general integrals depends on the form of the external load, on the constants of integration, and on the unknown coefficients of the "contour" polynomials. The author subdivides the different cases for the external load: a uniformly distributed load p = const., a uniformly distributed concentrated load p = const. along the straight line x = c, and a unif..mly distributed p = const. over the area of a rectangle. Different conditions are developed for the curved edges of the plate. The constants of integration are determined by their substitution into the system of differential equations. The boundary conditions on the parallel edges determine the "contour" functions. A system of algebraic equations which permit one to determine the unknown coefficients of the "contour" polynomials is obtained in accordance with

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these boundary conditions. In conclusion, the author emphasizes that the method he has proposed permits one to obtain a solution for any nonrectangular plates in the form of easily tabulated functions. Further, this method does not require selection of special approximating functions for bending of plates, which is necessary when a variational method is employed. The method also has advantages over the mesh method. In the first place, it is possible to make use of more accurate difference formulas on the boundaries. In the second place, with the same step length h in the Y direction, the basic system of differential equations associated with the discrete method approximates more accurately the differential equation of bending of an elastic plate than the system of algebraic equations used in the mesh method. Moreover, the accuracy in the X direction is still higher. In the third place the application of an irregular mesh to irregularly shaped plates complicates calculations, but the discrete method is free of this defect.

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L 16747-63 EWP(r)/EWT(m)/BDS AFFTC

S/124/63/000/004/041/064

AUTHOR: Petrov, Yu. P.

[redacted]

52

TITLE: Computation of the bending of resilient rectangular plates by the discrete method

26

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 4, 1963, 13, abstract 4V101 (Tr. Khar'kovsk. aviats. in-ta, vyp. 21, 1961, 3-36)

TEXT: The computation of small sags in nonrectangular plates by the direct method on the basis of two known differential equations of second degree is suggested by the author. The basic systems of differential equations, described in matrix form, contain n independent systems of usual differential equations, each of which contains two second-degree equations. The author studies the special cases of loading the plate, and describes in detail the boundary conditions at curvilinear boundaries. He gives expressions for trapezoidal plates and examples for triangular, rhomboidal and square plates. P. M. Varvak.

[Abstracter's note: Complete translation.]

Card 1/1

PETROV, Yu.P., kand. tekhn. nauk

Optimal rules for the regulation of the power plant during variable resistance of water to the movement of the ship. Trudy LIVT no.64: 5-10 '64. (MIRA 18:10)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001240520010-6"

L 3133-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)
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BOOK EXPLOITATION

Petrov, YUriy Petrovich

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Variation methods in the theory of optimum control (Variatsionnyye metody teorii optimal'nogo upraveniya) Moscow, Izd-vo "Energiya", 1965. 219 p. illus., biblio. 4000 copies printed

TOPIC TAGS: optimal control, automatic control, automatic control theory, variational calculus, dynamic programming, field theory, Euler equation, variational method

PURPOSE AND COVERAGE: This book is intended for engineers and scientific research workers who specialize in electronics and automatic control; it may also be useful for senior students in Vuzes. Classical methods of the calculus of variation and some of the newest methods such as the "maximum principle" and dynamic programming which are utilized in the theory of optimum control are outlined. The methods considered are applied to the solution of a number of engineering problems in the field of electric drives, power engineering, and electric transportation facilities. The basic

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part of the results presented in Chapters 3 and 6 is the result of the author's own, original investigations. The book also contains a brief historical outline of the development of the variational methods in mathematics and their application to the solution of engineering problems. There are 126 references: 122 Soviet and 4 Non Soviet

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SUB CODE: ME SUBMITTED: 02Feb65 NO REF SOV: 122

OTHER: 004

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PETROV, Yuriy Petrovich, kand.tekhn.nauk, mladshiynauchnyy sotrudnik

Heating of a rotor during an asynchronous start. Izv.vys.ucheb.zav.; elektromekh. 7 no.1:121-122 '64. (MIRA 17:6)

ACC NR: AM6027415 (N) Monograph

Petrov, YUriy Petrovich UR/

Optimum regulators of marine power plants; theoretical principles (Optimal'nyye regulyatory sudovykh silovykh ustanovok; teoreticheskiye osnovy) Leningrad, Izd-vo "Sudostroyeniye," 1966. 119 p. illus., biblio. 2400 copies printed.

TOPIC TAGS: marine equipment, ~~marine~~ power plant, ~~regulator,~~ optimum control, ~~system~~ SHIP COMPONENT

PURPOSE AND COVERAGE: This book is intended for engineers and scientists concerned with the design of power plants and control systems for river and seagoing vessels, and for students of marine transport institutes. It discusses techniques for estimating the most suitable operating levels for marine power plants under various sea conditions and the design of automatic regulators capable of maintaining these levels. There are 45 references, all Soviet.

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UDC: 629. 12—8—5

ACC NR: AM6027415

SUB CODE: 13, 12/ SUBM DATE: 15Feb66/ ORIG REF: 045

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KHAP... [illegible]
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[Experience in the [illegible]
[illegible] engines [illegible]
[illegible] Leningrad, [illegible]

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001240520010-6"

PETROV, Yuriy Viktorovich; SHEYLO, I.S., red.

[Cancer of the breast; its diagnosis, clinical aspects and treatment] Rak molochnoi zhelezy; diagnostika, klinika, lechenie. Leningrad, Meditsina, 1964. 207 p.
(MIRA 17:[illegible])

AVERBUKH, I.D., starshiy prepodavatel'; PETROV, Yu.S., dotsent; TURYSHEV, B.F., dotsent; TALALAYENKO, V.A., inzh.

Protection form electrocution when the excavator bucket touches the contact wire. Izv. vys. ucheb. zav.; gor. zhur. 6 no.6:130-137 '63. (MIRA 16:8)

1. Sverdlovskiy gornyy institut imeni V.V. Vakhrusheva. Rekomendovana kafedroy gornoy elektrotekhniki.

(Excavating machinery—Safety applicances)

EPSHTEYN, A.A.; AVAZHANSKIY, Yu.S.; IBRAGIMOVA, Ye.M., PETROV, Yu.S.

Study of an electric wireless communication channel between the well botoom and the surface. Mash. i neft. obor. no.5: 28-33 '64. (MIRA 17:6)

1. AzNIIburneft'.

DURNEV, N.Ya., kandidat tekhnicheskikh nauk; KALINICHENKO, V.F., inzhener; [redacted] kandidat tekhnicheskikh nauk; SERGEYEV, A.S., kandidat tekhnicheskikh nauk; TONKOSHKUR, L.S., inzhener.

Estimating expected electric loads for surfaces of iron ore mines. Gor. zhur. no.7:59-60 Jl '57. (MLRA 10:8)

(Electricity in mining)